

Context relevant persuasive interaction and design: consideration of human factors influencing B2C persuasive interaction

Conference or Workshop Item

Accepted Version

Alhammad, M., M. and Gulliver, S. R. (2013) Context relevant persuasive interaction and design: consideration of human factors influencing B2C persuasive interaction. In: The 35th International Conference on Information Technology Interface (ITI), 24 Jun - 27 Jun 2013, Zagreb, Croatia, pp. 161-166. (ALHAMMAD, M.M., GULLIVER, S. R. (2013). Context Relevant Persuasive Interaction and Design: Consideration of Human Factors Influencing B2C Persuasive Interaction. The 35th International Conference on Information Technology Interface (ITI).) Available at <http://centaur.reading.ac.uk/37493/>

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Context Relevant Persuasive Interaction and Design: Consideration of Human Factors Influencing B2C Persuasive Interaction

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Abstract.

The revolutions of electronic and mobile commerce have opened up unique opportunities for global marketing and business to consumer (B2C) persuasive interaction; with the aim of influencing user behavior. The success or failure of such persuasive interaction is impacted by cultural, social, and personal dimensions. Accordingly, failure to consider such dimensions risks the user forming a negative attitude towards retailer's websites or mobile applications, which subsequently threatens customer behavior. A better understanding of human factors influencing the way people perceive B2C persuasive interaction is needed. This paper introduces the concept of a context relevant persuasive interaction and proposes a guideline for designing relevant B2C persuasive interaction.

Keywords. E-Commerce, B2C Persuasive Interaction, Consumer Online Behavior, Human Factors, Culture Customization, Personalization.

1. Introduction

Electronic commerce (e-commerce) and mobile commerce (m-commerce) digital environments allows companies to target consumers ubiquitously across the globe. Although many firms and businesses have set up customized websites/apps for each country, featuring relevant language, currency, date, and content, such websites/apps typically have uniform persuasive strategies [23]. Persuasive interaction design features are, however, unlikely to be globally attractive to and influential upon consumers, and designs tools can struggle to generically reflect consumer's specific personal, social, and cultural features [7]. An inability to consider these specific features risks the formation of misunderstandings, within user information assimilation and interaction,

resulting in negative attitudes towards online shopping which impacts resulting user behavior.

According to Dey [4], context includes any information that can be used to characterize the situation of an entity; with an entity being defined as a person, place, or an object that is relevant to the interaction between a user and an application. Since user's response to interaction is based on their personal perceptions, values, social/ cultural norms, and situation context [22], we assume customers unconsciously perceive online persuasive interaction based on these factors. In this paper, we consider human factors (i.e. personal, social, and cultural factors) influencing user's perceptions of B2C persuasive interaction. We also suggest how persuasive interactions could be more influential by considering both personal and cultural features in the design of websites/apps.

2. Persuasive Interaction

Although the concept of persuasion arouses a variety of understandings, Fogg defines it as "an attempt to shape, reinforce, or change behaviors, feelings, or thoughts about an issue, object, or action" [5]. Persuasive technology was introduced by Fogg and defined as relating to "any interactive product designed to change attitude or behavior by making desired outcomes easier to achieve" [6]; and has a huge practical potential in the area of behavior management, e.g. quitting smoking, diet management, website credibility or motivating users to buy online.

Communication within persuasive technologies involves three elements: the source, the receiver, and the message. The source attempts to persuade the recipient to adapt his/her attitudes, behavior, or both via messages. Message content and the media channel used to deliver messages differentiate the value of messages; and subsequently the impact that the message has on the recipient. According to the

functional triad framework [6], computers play three major persuasive roles which are: tool, media, and social actor; which implies computers can be used as a persuasive tool via automation [6]. Amazon's one-click buying technique, for example, allows consumers to buy online simply with a single click. Computers, as a media, apply simulation to motivate users by making them aware of the cause and effect of behavior; however this is not commonly applied in digital shopping environment. Lastly, computers, used as a persuasive social actor, represents an open opportunity for social influence [6]. Many e-commerce websites present a sense of social presence, e.g. greeting messages, that guide the shopper to products that they may like; often applying similar social dynamics to those experienced by a shopper in a physical shop.

3. Persuasive Interaction amongst Seller and Buyer

Interaction between people involves the common exchange of information using words, means, and body language to pass ideas and knowledge; via the richness of a mutual language and understanding of 'how things work' (i.e. perceptions, values, and social/cultural norms), and/or an implicit understanding of the current situation [4, 22]. Thus, consideration of these elements is vital in achieving a desired outcome.

3.1. Interaction in Traditional Physical Store

Traditionally interaction in the physical shops involved the buyer exposing themselves to a range of potential persuasive techniques, managed by sales-persons. Consumers exposure to a range of persuasive techniques aimed to increase consumer's trust in the salesperson, leading to customer's satisfaction, which in turn leads to an intention to buy [25] (see Figure 1).

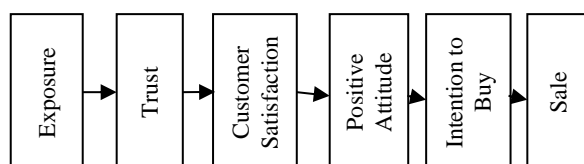


Figure 1. Purchasing Behavioral Process for Buying from Physical Shop [25].

Skilled salespersons influence and motivate consumers towards a favorable purchasing

decision via use of implicit persuasive interaction based on the context of the sale [6], and consumer contextual feedback (such as signs, body language, voice)[22]. For example, a customer visiting a bookstore might be offered help by a sales-person. If the customer responds positively, the salesperson can apply persuasive strategies to encourage the browsing customer towards a purchase. If the customer seems unwilling to buy due to price, the salesperson can propose a mutually acceptable discount or a less costly alternative; thus adapting the information and level of social interaction [10].

3.2 Interaction in the Digital Shopping Environment

The key objective of the websites/apps is to present product and service information to consumers to maintain efficient interaction and communication; resulting in customer satisfaction. Throughout the purchase process, the websites/apps should minimize any anxiety associated with the virtual nature of the interaction [28], and the lack of social interaction. Moreover, in order to reduce anxiety, the website and persuasive interaction should positively influence targeted consumers; ensuring perception of an acceptable level of social interaction via use of technologies such as chat rooms, real-time video chat, etc.

Before consumers are familiar with the digital shopping environment, they lack prior experience or knowledge concerning purchase interaction. Accordingly, in terms of initial inclination, consumers are in one of these three states [10]: positive due to the excitement of interacting with new company/website, neutral without specific feelings, or negative due to anxiety of interacting with a new company/website. Their initial inclination will be significantly impacted, however, by assimilated information concerning this behavior from credible sources.

According to Sutcliffe [24], consumers pass different interaction stages when interacting with e-commerce websites. Once consumers interact with a website, initial perceptions concerning aesthetics often persuade the user to stay on the website for a longer duration to explore it in more detail. If the user is attracted by the website design, and has been persuaded to stay, the user explores the website by looking for goods or service information. At this stage, ease of use is essential to ensuring a perception of usability. At

this stage it is vital to avoid errors in navigation, or difficulties that risk the user terminating interaction [24]. Once the user has selected the goods, and decided to buy, the transaction stage begins. The transaction stage relies on operational usability, however price becomes the key differentiator [21].

The practice of persuasive techniques is increasingly being applied in digital interactive sales and marketing [12], for the purpose of increasing credibility and trust, and to motivate consumers to participate in online shopping activity. Although the science of persuasive interaction can be applied at all three stages of interaction, it is clear that buying behavior is influenced significantly by personal, social, and cultural features; with the perceived benefit of different persuasive interaction methods also impacted by these factors. The next section discusses effects of human factors on persuasion.

4. Human Factors Influencing B2C Persuasive Interaction

According to stimulus-response theories [16], there are four factors influencing consumers buying behavior: cultural, social, personal, and psychological factors. These factors were categorized by Crawford [3] into two groups: endogenous (personal and psychological factors) and exogenous (cultural and social factors). These factors are emphasized by the persuasive systems design (PSD) model [18] whilst analyzing the persuasion context, i.e. the user context. The analysis of user context in a wider description includes analyzing user's interests, needs, goals, abilities, motivations, pre-existing attitudes, consistency, life style, persistence of change, cultural factors, social anchors and personality [18]. Hence, these factors are understood and must be considered when designing B2C Persuasive Interaction.

4.1 Exogenous Factors

According to Hofstede, culture is “the collective programming of the mind which distinguishes the members of one group or category of people from those of another” [9]. Although Web technologies have seemingly caused the globe to shrink, cultural distance between individuals is huge; with cultural norms impacting almost all human behavior [20]. Cultural elements, play a significant role in

technology acceptance, and influence consumer attitude and behavior when accepting or rejecting such technology [1, 19]. Therefore, culture defines a significant part of the context where consumers learn to perceive and use the digital shopping environment in a particular way.

Trompenaars and Hampden-Turner [27] describe a cultural model consisting of three layers, which influences individual's behavior (see Fig 2). The top layer “the explicit layer” includes explicit signs that distinguish them (i.e. language, food, art, etc.). The middle and the lower layers are hidden, and are therefore not easily recognized and captured without in-depth observation. When considering the design of websites and persuasive interaction strategies, designers often customize content based on the explicit cultural layer (e.g. language), yet few websites consider middle and lower layer cultural norms and values during customizing.

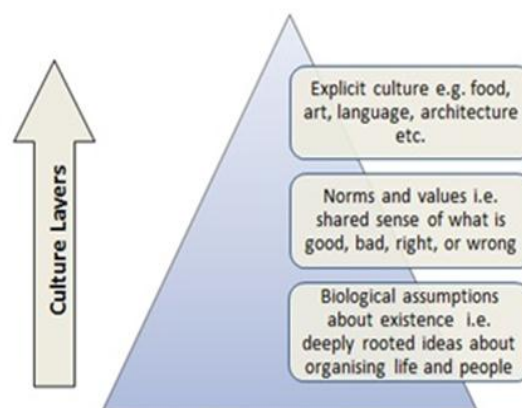


Figure 2. Culture Layers, based on Trompenaars and Hampden-Turner [20]

According to Hall [8], “culture is communication”; hence, in order for two people to communicate and interact with each other effectively, they must be able to decode messages appropriately. Without sharing the same values, cultural norms, and beliefs, two people from different cultures may interpret the same message differently by ignoring or emphasizing importance on different parts of the message [8]. In the case of e-commerce, both website designers and users are products of their culture; with designers unconsciously reflecting their cultural norms and beliefs in the design of the website, and users applying their cultural norms and beliefs in order to decode and understand messages of the design elements. The bigger the cultural gap between the website design and users, the more difficult it is to

achieve successful interaction. In order to support the decoding of messages, Hall categorizes national culture into two-categories: high-context (HC) and low-context (LC). In HC cultures both the sender and the recipients rely on the context of the communication process. Therefore, the need for social presence is emphasized. In LC cultures, people involved in the communication rely mainly on the information provided in the message itself.

Cultural characteristics impact the type and form of persuasive messages used to achieve effective interaction and communication, however to date much of the research concerning persuasive technology has originated from America [15], which is characterized as a LC and individualistic culture [8, 9, 26]. If culture is not appreciated in the interpretation of research, we risk persuasive research reflecting the beliefs and cultural norms of a particular audience; instead of targeting users with different cultural norms. Moreover, testing the effectiveness of persuasive technologies on participants from LC cultures does not necessarily mean that similar methods would work in a HC culture [2, 17]. It is therefore important to consider cultural context of users when designing persuasive interactions.

4.2 Endogenous Factors

Individual differences, personality, and psychology all contribute in forming consumers behaviour and consumers perception of persuasive interaction [16, 18]. Personality is an individual's particular response pattern of thought, emotion, attitude, and behavior.

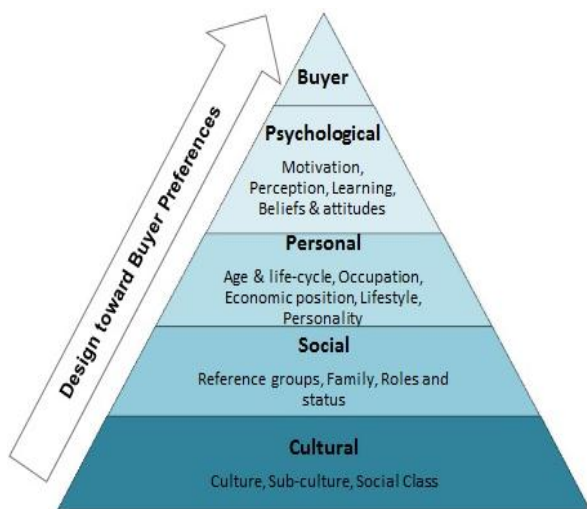


Figure 3. Bottom-up approach towards design of consumers buying behavior.

Literature implies that user information assimilation and interaction are influenced by users' personality and cognitive style. Consumers differ in the way they process, perceive, and evaluate information as well as the way they construe their experiences. Hence, as the differences in consumers personality and cognitive style underlie consumers needs, interests, values and motivation [11], consumers response to stimuli and persuasive interaction differ as a result of these factors. Thus, in order to successfully increase consumers motivation, and persuade them to purchase online, it is necessary to identify and use persuasive techniques that match consumers personality and cognitive style.

5. Guidelines for Designing Context Relevant Persuasive Interaction

We propose that the design of persuasive interaction should be drawn based on human factors, particularly consumers' culture and personality. Persuasive designers should use a bottom-up approach to tailor the design towards buyer preferences; starting by tailoring the design to reflect consumers' cultural and social motivations followed by consumers or individual personal motivation (see Fig. 3). Our developed guideline (see Fig. 4), for designing context relevant persuasive interaction, is based on this approach; and highlights that two levels of customization are needed to achieve a more effective context relevant persuasive interaction design. The first level relates to tailoring and

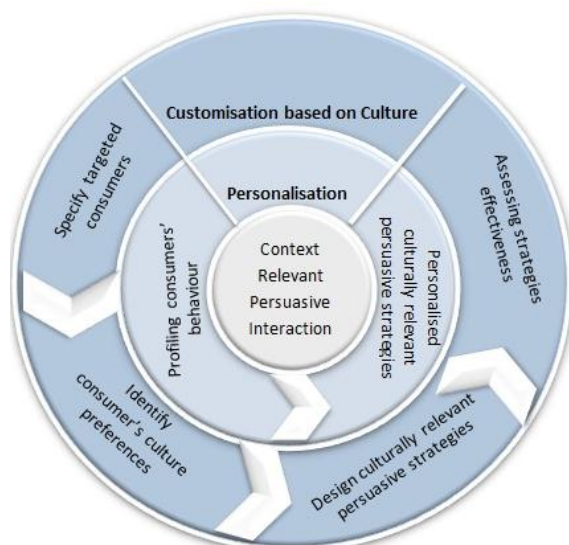


Figure 4. Guideline for designing context relevant persuasive interaction.

customizing the design based on targeted consumer's culture, whilst the second level relates to personalize the design based on personal and individual differences.

5.1. Customization based on Cultural Theme

In order to design persuasive interaction, which are more effective and meaningful to motivate and persuade new customers to trust interaction, designers should make the main persuasive interaction reflect the cultural characteristics of the targeted consumers. Khaled [14] identified culturally relevant persuasive interaction as “interactive computing products created for the purpose of changing people's attitudes or behaviors, that reflect the cultural motivations of their target users”. When culture is considered as communication, as defined by Hall, we see that if the persuasive interaction matches the cultural theme of the targeted consumers, consumers' perception will more likely align to persuasive messages; thus more likely influencing consumer attitude or behavior. One key problem, however, associated with the design of persuasive strategies to the inclusion of company and designer unconsciously cultural preferences. Companies and designers make design decisions based on what they feel to be persuasive. Hence, the first customization needs to incorporate persuasive strategies that reflect consumer, and not the designer, culture.

Customization should reflect not only the explicit cultural factors, such as language, but also non-explicit cultural norms and assumptions. For example, if the targeted consumers are characterized as being highly collectivistic (i.e. a HC culture), they give a higher priority for the opinions of others within their 'in-group'. Thus, a group opinion strategy is appropriate as it presents the opinion of what others thought about the retailer website, products, or services; which would effectively lessen consumers' anxiety and support the consumer to make a decision to purchase online.

5.2 Personalization based on Individual Preferences

Once the design has been customized around generic cultural preferences, the next level relates to personalization of specific persuasive

interaction strategies to match consumer personality. Kaptein and Eckles [13] introduced the idea of a persuasion profile to identify the most appropriate strategies for each individual. By monitoring and recording consumer behavior, via mouse over and click points, personalization is possible. However, using persuasion profile alone is not effective with a new customer. Based on our guideline, the problem of 'cold start' customers is overcome by customizing the design to match users' cultural preferences. By doing this, we capture the way new users' behave and interacting with persuasive interaction strategies in a new user persuasion profile. By adapting the design of persuasive interaction based on the users' persuasion profile we maximize the possibility of positive customer behavior.

6. Conclusion and Future Work

Khaled [14] stated that in order for a persuasive message to be effective, it is essential to draw upon the cultural themes of targeted users. Kaptein and Eckles [28] propose that persuasive messages should be adapted based on user susceptibilities to different strategies. In our guideline we suggest that both customization and personalization needs to be achieved in order to achieve effective context relevant persuasive design. Therefore, persuasive technology designers are highly recommended to reflect the cultural themes of the targeted users in the design of persuasive interaction.

Future research should develop a full framework for culture adaptation by studying the influence of context relevant persuasive interaction systems on consumer perception of purchasing online. Moreover, research should focus on analyzing the influence of such design on consumers' purchasing intention, since research in this area is limited.

7. References

- [1] Alhammad, M.M., et al., Culture, Cognition and E-Commerce Behaviour, in the 14th International Conference on Informatics and Semiotics in Organisations (ICISO)2013, SciTePress: Stockholm, Sweden
- [2] Biswas, A., J.E. Olsen, and V. Carlet, A comparison of print advertisements from the United States and France. *Journal of Advertising* 1992: 73-81.

- [3] Crawford, I., Buyer Behaviour, in Agricultural and food marketing management1997, FAO.
- [4] Dey, A.K., Understanding and using context. Personal and Ubiquitous Computing 2001; 5(1): 4-7.
- [5] Fogg, B.J., Persuasive Computers: Perspectives and Research Directions, in SIGCHI conference on Human factors in computing systems1998: Los Angeles. p. 225-232.
- [6] Fogg, B.J., Persuasive Technology: Using Computers to Change What We Think and Do. San Francisco: MORGAN KAUFMANN; 2003.
- [7] Gibbs, J., K.L. Kraemer, and J. Dedrick, Environment and policy factors shaping global e-commerce diffusion: A cross-country comparison. The Information Society 2003; 19(1): 5-18.
- [8] Hall, E.T. and M.R. Hall, Understanding Cultural Differences: Intercultural Press; 1990.
- [9] Hofstede, G., G.J. Hofstede, and M. Minkov, Cultures and organizations: software of the mind. USA: McGraw-Hill; 2005.
- [10] Jahng, J., H. Jain, and K. Ramamurthy, Effects of interaction richness on consumer attitudes and behavioral intentions in e-commerce: some experimental results. European Journal of Information Systems 2007; 16(3): 254-269.
- [11] Kaplan, R.M. and D.P. Saccuzzo, Psychological Testing: Principles, Applications, and Issues: Cengage Learning; 2009.
- [12] Kaptein, M. and D. Eckles, Heterogeneity in the Effects of Online Persuasion. Journal of Interactive Marketing 2012.
- [13] Kaptein, M. and D. Eckles, Selecting Effective Means to Any End: Futures and Ethics of Persuasion Profiling, in The 5th International Conference on Persuasive Technology 2010, 82-93: Copenhagen, Denmark.
- [14] Khaled, R., Culturally-Relevant Persuasive Technology, in School of Mathematics, Statistics, and Computer Science2008, Victoria University of Wellington. p. 256.
- [15] Khaled, R., et al., Persuasive interaction for collectivist cultures, in The Seventh Australasian User Interface Conference2006, Australian Computer Society, Inc. p. 73-80.
- [16] Kotler, P. and G. Armstrong, Consumer Markets and Consumer Buyer Behavior, in Principles of Marketing2004, Financial Times/ Prentice Hall.
- [17] Lin, C.A., Cultural differences in message strategies: A comparison between American and Japanese TV commercials. Journal of Advertising Research 1993.
- [18] Oinas-Kukkonen, H. and M. Harjumaa, Persuasive systems design: Key issues, process model, and system features. Communications of the Association for Information Systems 2009; 24(1).
- [19] Rambo, K. and K. Liu, Culture-Sensitive Virtual E-Commerce Design with Reference to Female Consumers in Saudi Arabia, in Virtual Worlds and E-Commerce: Technologies and Applications for Building Customer Relationships2010, IGI Global.
- [20] Rosenbloom, B. and T. Larsen, Communication in international business-to-business marketing channels: Does culture matter? Industrial Marketing Management 2003; 32(4): 309-315.
- [21] Schaffer, E. Beyond Usability Designing for Persuasion, Emotion, and Trust (PET designTM). [White paper] 2008.
- [22] Schmidt, A., Implicit human computer interaction through context. Personal and Ubiquitous Computing 2000; 4(2): 191-199.
- [23] Sia, C.L., et al., Web strategies to promote internet shopping: is cultural-customization needed. Mis Quarterly 2009; 33(3): 491-512.
- [24] Sutcliffe, A., Assessing the reliability of heuristic evaluation for Web site attractiveness and usability, in the 35th Annual Conference on Hawaii International System Sciences2002, IEEE. p. 1838-1847.
- [25] Swan, J.E., M.R. Bowers, and L.D. Richardson, Customer trust in the salesperson: an integrative review and meta-analysis of the empirical literature. Journal of Business Research 1999; 44(2): 93-107.
- [26] Triandis, H.C., et al., Individualism and collectivism: Cross-cultural perspectives on self-ingroup relationships. Journal of personality and Social Psychology 1988; 54(2): 323.
- [27] Trompenaars, A. and C. Hampden-Turner, Riding the waves of culture: understanding cultural diversity in global business: McGraw Hill; 1998.
- [28] Wells, J.D., W.L. Fuerst, and J.W. Palmer, Designing consumer interfaces for experiential tasks: an empirical investigation. European Journal of Information Systems 2005; 14(3): 273-287.